

ABSTRACT

A perfluoropolyether, a composition comprising the perfluoropolyether, a process for producing the perfluoropolyether, and a process for improving the thermostability of grease or lubricant are provided. The perfluoropolyether  
5 comprises perfluoroalkyl radical end groups in which the radical has at least 3 carbon atoms per radical and is substantially free of perfluoromethyl and perfluoroethyl end groups. The process for producing the perfluoropolyether can comprise (1) contacting a perfluoro acid halide, a C<sub>2</sub>- to C<sub>4</sub>-substituted ethyl epoxide, or a C<sub>3</sub>+ fluoroketone with a metal halide to produce an alkoxide;  
10 (2) contacting the alkoxide with either hexafluoropropylene oxide or tetrafluoro oxetane to produce a second acid halide; (3) esterifying the second acid halide to an ester; (4) reducing the ester to its corresponding alcohol; (5) converting the alcohol with a base to a salt form; (6) contacting the salt form with a C<sub>3</sub> or higher olefin to produce a fluoropolyether; and (7) fluorinating the  
15 fluoropolyether. The process for improving the thermostability of a grease or lubricant comprises combining the grease or lubricant with the composition.